

Propane as Mowing Equipment Fuel

EAST TENNESSEE
**CLEAN
FUELS**
TNCleanFuels.org



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EASTMAN



GIBSON COUNTY
UTILITY DISTRICT

**OAK
RIDGE**
National Laboratory

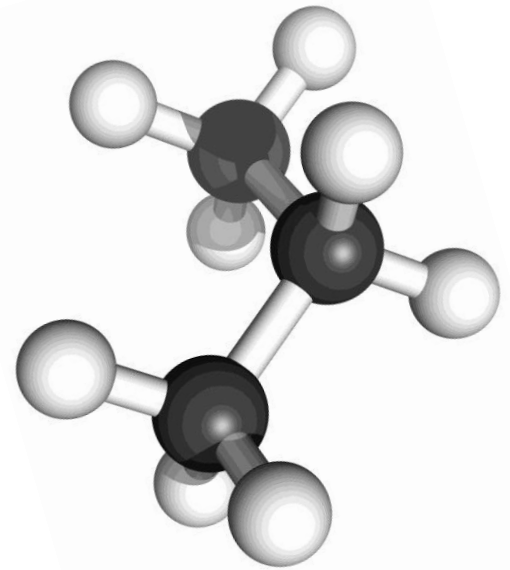
WM
WASTE MANAGEMENT

THE UNIVERSITY of
TENNESSEE **UT**
KNOXVILLE

**Clean
Cities**

Propane Basics

- Hydrocarbon: C₃H₈
- May be referred to as liquid petroleum gas, or LP
- A gas at normal temperatures and pressures but becomes liquid at high pressures
- Byproduct of natural gas/oil refining processes
- Colorless and odorless; mercaptan added for safety



Propane Uses

- Home and water heating
- Grills, cooking, and refrigeration
- Farm/industry equipment power
- Vehicle and lawn equipment fuel
- Third most common vehicle fuel worldwide



Lawn Butler, Knoxville

Propane Benefits



Photo courtesy of NREL

- Safety: narrow range of flammability when compared with other petroleum products
- An approved clean fuel listed in the 1990 Clean Air Act & National Energy Policy Act of 1992
- One of the lightest, simplest hydrocarbons in existence & one of the cleanest burning of all fossil fuels
- 90% domestically produced
- No threat to ground water, surface water, or soil if released

Common Grounds Landscaping

- Started with two propane mowers in 2009 as part of a study with UTK
- By 2014, had 15 mowers running on propane
- Nearing total fleet conversion as of 2016
- Currently: 18 propane mowers, both OEM and conversions



Turf Managers LLC



- After reviewing many alternative fuels for mowing equipment, propane was the “clear winner”
- Currently, 10 of 14 mowers run on propane
- All new mower purchases will be OEM propane

City of Kingsport

- Began with propane for police fleet (state's largest propane fleet)
- Added propane mowers later on
- Currently owns six SCAG Turf Tigers



City of Knoxville



- Started by converting two Gravely mowers to propane in 2014
- Recently purchased nine additional propane mowers
- Purchased for “cost reduction, improved services, and good environmental stewardship with the added bonus of using domestic fuel.”

University of Memphis

- Spearheaded by adjunct professor of mechanical engineering, Dr. Steven Wayne
- Converted two mowers with funds from the university's "Sustainable Campus Green Fee"
- Also runs physical plant support vehicle on propane



Photo courtesy of PERC

Great Smoky Mountains National Park

- Converted five Gravely mowers through a grant (partnering with East TN Clean Fuels)
- Acquiring two more in near future
- All staff pleased with performance



Why are these companies using propane?

- **Lower operating costs:** Propane mowers cost less per hour to operate and the majority of fleets note less down time for maintenance.
- **Fewer emissions:** Propane has fewer carbon emissions than conventional fuels. Compared with gas, propane reduces GHG emissions by over 15% and CO by over 40%.
- **Easy on-site refueling**
- **Reduced fuel spills and theft**
- **Propane is suitable for any size fleet**
- **Quick ROI on conversions or upgrades**

Brands that Support Propane



Manufacturers with proven performance are offering propane models.

Conversion kits are available and can be installed in just a few hours.

Propane Mower Incentives

- Propane Education & Research Council (PERC) is offering a propane mower conversion incentive through April 30, 2016.
- Incentive is for \$1,000 per qualifying new mower purchase or \$500 per qualifying mower conversion.
- Visit www.propane.com/mowerincentive for more information.



Other Resources

- Propane mower calculator app available for Apple and Android
- For commercial landscaping information, visit www.propane.com/commercial-landscape
- More case studies and testimonials at www.propane.com

The screenshot shows the 'PROPANE MOWER CALCULATOR' interface. It features a green header with the title. Below the header, there are several input fields and sliders for configuring the calculation. On the right side, there are three summary boxes showing fuel costs per hour, fuel costs per year, and total savings using propane.

PROpane MOWER CALCULATOR

Compare Propane with: **DIESEL** **GASOLINE**

Number of Mowers:

Total Hours Mowed per Year (per mower):

Propane Mower Purchase Amount:

Gasoline Mower Purchase Amount:

Price per Gallon:

FUEL COSTS PER HOUR OF MOWING

PROPANE **\$20.40**

GASOLINE \$28.60

FUEL COSTS PER

1 YEAR 3 YEARS 5 YEARS

PROPANE **\$61,200**

GASOLINE \$85,800

TOTAL SAVINGS USING PROPANE

1 YEAR 3 YEARS 5 YEARS

\$24,600

SHARE

Questions?

Thank you!

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Visit cleancities.energy.gov for more information about the U.S. DOE Clean Cities program.